

CLAIMS

What is claimed is:

1. A network element, coupled to a first uni-directional link having a first direction and a second uni-directional link having a second direction, the network element comprising:

a monitor module, coupled to the first link, adapted to detect a failure on the first link and further adapted to transmit a failure signal;

a controller, coupled to the monitor module, adapted to receive the failure signal and further adapted to transmit a first control signal; and

a mesh protection service (MPS) module, coupled to said controller, adapted to receive the first control signal and further adapted to transmit on the second link an MPS message signal;

wherein said MPS message signal includes information regarding the failure of the first link; and

wherein said first direction and said second direction are different directions from one another.

2. The network element of claim 1 further comprising:

a protection link module, coupled to said controller, adapted to receive a second control signal from the controller and further adapted to transmit a protection signal to the

controller, wherein the protection signal includes information regarding the availability of a protection link for the first link.

3. The network element of claim 1 further comprising a signaling and routing module, coupled to said controller, adapted to receive a second controller signal from the controller and further adapted to transmit a release message signal.

4. The network element of claim 1 wherein the MPS message signal is a line-level signal.

5. The network element of claim 1 wherein said MPS message signal is included within an overhead byte.

6. The network element of claim 1 wherein said second link is an out-of-band link.

7. A communications network comprising:

a first network element;

a second network element;

a first uni-directional link, wherein said first link is coupled between the first network element and the second network element and said traffic can be transmitted in a first direction along the first link, wherein said first direction is from the first network element to the second network element;

a second uni-directional link, wherein said second link is coupled between the first network element and the second network element and said traffic can be transmitted

in a second direction along the second working link, wherein said second direction is from the second network element to the first network element;

wherein said second network element includes:

a monitor module, coupled to the first working link, adapted to detect a failure on the first link and further adapted to transmit a failure signal;

a controller, coupled to the monitor module, adapted to receive the failure signal and further adapted to transmit a first control signal; and

a mesh protection service (MPS) module, coupled to said controller, adapted to receive the first control signal and further adapted to transmit on the second working link an MPS message signal;

wherein said MPS message signal includes information regarding the failure of the first link.

8. The communications network of claim 7 further comprising:

a third network element;

a third uni-directional link, wherein said third link is coupled between the first network element and the third network element and said traffic can be transmitted in a third direction along the third link, wherein said third direction is from the first network element to the third network element;

wherein in response to said MPS message signal, said first network element transmits a release message signal to said third network element.

9. The communications network of claim 7 wherein said second network element includes a protection link module, coupled to said controller, adapted to receive a second control signal from the controller and further adapted to transmit a protection signal to the controller, wherein the protection signal includes information regarding the availability of a protection link for the first link.

10. The communications network of claim 7 further comprising:

a third network element, coupled to said second network element;
wherein the second network element further comprises a signaling and routing module, coupled to said controller, adapted to receive a second controller signal from the controller and further adapted to transmit a release message signal.

11. The communications network of claim 7 wherein said MPS message signal is a line-level signal.

12. The communications network of claim 7 wherein said MPS message signal is provided in an overhead byte.

13. The communications network of claim 7 wherein said MPS message signal is transmitted on an out-of-band link.

14. A computer readable storage medium for use with a processor in a network element, the storage medium having machine-readable computer program code, the storage

medium including instructions for causing the processor to implement a method comprising the steps of:

detecting on a first uni-directional network element a failure on a first link, wherein said first link is coupled between the first network element and a second network element; and

transmitting on a second uni-directional link, coupled between the first network element and the second network element, a mesh protection services message from the first network element to the second network element, wherein the mesh protection services message includes information regarding the failure of the first link.

15. The computer readable storage medium of claim 14 including further instructions for causing the processor to implement a further step of transmitting a release message signal from the first network element to a third network element.

16. The computer readable storage medium of claim 14 including further instructions for causing the processor to implement the further steps of:

determining whether a first protection link, coupled between the first network element and the second network element, is available for carrying traffic redirected from the first link; and

if the first protection link is determined to be available, redirecting traffic from the first link to the first protection link.

17. A method for mesh protection services in a communications network comprising a plurality of network elements, the method comprising the steps of:

detecting on a first network element a failure on a first uni-directional link, wherein said first link is coupled between the first network element and a second network element and said first working line has a first direction; and

transmitting on a second uni-directional link, coupled between the first network element and the second network element and having a second direction, a mesh protection services message from the first network element to the second network element,

wherein the mesh protection services message includes information regarding the failure of the first link; and

wherein said first direction and said second direction are different directions from one another.

18. The method of claim 17 further comprising the step of transmitting a release message signal from the first network element to a third network element.

19. The method of claim 17 further comprising the steps of:

determining whether a first protection link, coupled between the first network element and the second network element, is available for carrying traffic redirected from the first link; and

if the first protection link is determined to be available, redirecting traffic from the first link to the first protection link.

20. A method for mesh protection services in a communications network comprising a plurality of network elements, the method comprising the steps of:

receiving on a first network element from a first link, coupled between the first network element and a second network element and having a first direction, a mesh protection services (MPS) message signal; and

transmitting from the first network element to a second link, coupled between the first network element and a third network element and having a second direction, a release message signal,

wherein said first direction and said second direction are different directions from one another.